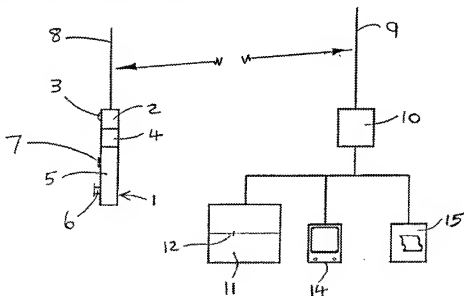


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(54) Title: PHOTOGRAPHIC SECURITY SYSTEM



(57) Abstract

A portable security system (1) consisting of an electronic camera module (2) with a lens (3), a Global Positioning System module (4) and a combined memory and transmitter module (5) which includes a microphone (7). When sound-activated via microphone (7) or activated by manual operation of the button (6), the camera module (2) photographs the scene and feeds the image to the transmitter module (5), also the Global Positioning System module (4) receives positional information for satellites and converts the received information into display information, and the transmitter module (5) transmits the image and the display information to a remote receiver (10) for conversion into a printed image on a facsimile receiver (15) and into a display of the transmitter's position on a map (11).

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PHOTOGRAPHIC SECURITY SYSTEM

Conventional security systems rely on two basic concepts.

One

Maintaining a physical barrier, impenetrable by a determined burglar, i.e., high wire fence, barbed wire, bars over windows and armoured doorways.

Two

Systems designed to set off an alarm by an intruder, i.e., very thin wires within fragile tubes which when broken set off an alarm. Thin tape glued to glass windows again which when broken set off an alarm. Pressure pads which when trodden on set off an alarm. These and other similar switches all have the same aim in mind which is to alert the general public and/or in more sophisticated devices through recorded messages, the Police or other security services to the presence of an unwanted intruder.

All of these systems have a fundamental flaw in their design which makes it impossible to identify either the potential intruder or the actual intruder by any other means than by being caught red-handed in the process of making such a burglary or through the forensic science means of identifying that a particular individual made the

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intrusion, for example, by identification of finger-prints or through identification of clothing fibres.

It is the purpose of this proposed invention to introduce a method of clearly identifying an intruder immediately upon his or her entry into a restricted area and to transmit that information of their identity immediately to another secure place.

The original idea for this came from addressing the problem of such identification and the inventor looked at a wide variety of ideas. For example, in the first instance, it was assumed that the normal photographic process of creating an image on a piece of paper or transparent film would be necessary. Here for example, one would have the problem of not only concealing the camera but also then ensuring that a determined burglar could not gain access to the resulting image while on the premises. For example, such a camera could be set into a solid wall whereby the container holding the images would only be accessible through the physical destruction of the fabric of the building. With such a system in an automobile, it would be necessary to construct such a camera in such a way that again physical destruction of the fabric of the car would be the only reasonable means of access to such an image.

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As can be seen, while this presents a possible route towards an effective system, such a system would have inevitable drawbacks caused by the difficulties of securing the image from the determined burglar. Modern technology, however, makes it possible to contemplate a burglar identification system which makes use of many of the new aspects of high technology electronics. By taking an electronic photograph of an intruder, it is now possible to contemplate the transmission of that image via electronic means in all manner of methods available. For example, such an image may be transmitted via telephone lines using modern facsimile transmission technology to produce a facsimile image of such an intruder, for example, at the local Police Station. Such a facsimile image of an intruder would confirm the presence of such a person thus eliminating at a stroke many of the disadvantages caused by a repeated false alarm from today's more conventional security systems.

Again, modern electronic systems make it possible to conceive of a vehicle security system which would similarly pass on the image of the thief via the transmission of the photograph of the intruder.

Once the basic concept is grasped, then it becomes possible to add other information as necessary. The simplest first of all would be to provide within direct relationship of the view finder a simple load cell device

which would give a measurement of the weight of the intruder. This information could be transmitted with the photograph.

Just as easily, it can be organised that a simple height reference mark can be created so that the height of the intruder is also recorded. Thus with just these two simple measures, even though the intruder might be wearing some form of mask or hood to hide their facial identity, it would be possible to establish the height and the weight of an intruder which would help in subsequent police identification.

In the case of cars, modern satellite navigation systems make it possible to provide reasonably accurate information regarding the location of the stolen car so that such a system, when activated, may preferably continue to transmit this location information perhaps as photographs bearing such additional location information on a regular basis thus considerably enhancing the possibility of catching a vehicle thief. This would particularly be useful when dealing either with systematic crime by a gang using a fixed premises to change the identity of the vehicles or again, where heavy goods vehicles are involved with the transfer of cargo.

Additional security can be provided by using more than one means to transmit such information or again to store such images electronically via any means including the use of modern, magnetic, scanning, laser beam scanning, or any other modern optical or photographic process.

As can be seen, the creation of such security equipment offers a whole new range of opportunities to catch criminals. They will be identified immediately upon entering a premise or a vehicle. The date, time of day, and other interesting and useful information can be transmitted immediately even if the criminal subsequently manages to destroy the transmitting equipment, perhaps before the full image has been transmitted, there will still be the possibility of electronic storage of such information at any random location thought desirable. False alarms will be largely eliminated because the alarm will also produce clear confirmation of the presence of an intruder. Indeed, it could be argued that the old fashioned concept of an alarm signal would not be in the interests of this more intelligent security system as the real problem of identifying the intruder will be largely overcome.

Images may be collected by any means including the conventional photographic process which would allow the image to be collected and processed at a later date. Similarly, images may be created by instant photographic

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means and stored for collection at a later date. Images may be collected photographically, for example, via instant photography and the images transmitted via facsimile transmission equipment or other electronic means. Images may be created and transmitted by any of the known electronic methods. Transmission of the images may be by any electronic or radio transmission means. Images may be transmitted via conventional or individually dedicated transmission lines including conventional telephonic or telegraphic systems.

Further information may be added to such gathered, collected and/or transmitted information such as weight, height, time of day, date, and in the case of motor vehicles, actual location via any means capable of providing the information within such a transmission. Such location information may also be gathered and recorded within any means within the vehicle in such a manner that it may be accessed or read out at a later date when the vehicle is found if for any reason the transmission system fails. Similarly, such storage and retrieval of information would be possible for any of the systems described to act as a background if failure of the primary transmission system fails. Images transmitted may be in simple black and white or in full technicolour or in any electro-magnetic spectrum felt necessary to provide adequate information on the intruder.

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With the advent of mobile telephone or radio telephone equipment it now is possible to conceive of a portable system which would allow all the afore-mentioned principles to be available to a pedestrian. Thus in a hold-up situation, the victim could ensure a photograph of the criminal or criminals, their location, time of day for example. Additionally any purse, or bag carrying valuables could be similarly fitted to provide perhaps all these functions so that stolen property may be located after the crime. Again, command and control may be provided using any suitable navigation system so that the location of a crime is displayed on a map at the same moment perhaps as other identifying information arrives.

A schematic example of a portable photographic security system is illustrated in Figure 1. The portable photographic security system transmitter 1 is made up from a number of interconnected elements, each of which is known per se as a separate unit, namely an electronic camera module 2, with a lens 3, a Global Positioning System (GPS) module 4, and a combined memory and transmitter module 5. The memory and transmitter module 5 preferably have an activation button 6 and provision is made for any other preferable sensor 7, for example, a microphone. This may be convenient to allow transmission of what may be heard being said. Again such a microphone may preferably activate the system if a loud noise such as a gunshot or scream takes place.

Any activation of the system will immediately cause the following to happen. One - calculation of the exact position of the portable photographic security system transmitter via the GPS module. Two - activate as necessary the electronic camera module to photograph the immediate area. Three - store all this information electronically within the internal memory while at the same time transmitting the name and address of the user,

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date, time of day, exact location, a photograph of the immediate area plus preferably sound.

All this information may preferably be transmitted using existing radio transmission systems, for example, cellular radio, via an aerial 8 to a receiving aerial 9 connected to a distant receiver 10. The receiver 10 may be in turn preferably connected to a map display 11. Map display 11 may preferably be so constructed as to be able to move a crosswire 12 immediately to show the actual location of the portable photographic security system transmitter 1 upon the map. The receiver 10 may preferably be connected to a television display 14, thus giving direct display of any visual picture and sound transmission, along with the other location and user information. The receiver 10 may also preferably be connected to a facsimile receiver 15 giving a hard copy of the transmitted image and information.

At first glance this combination of modules would appear to need a substantial size external package to hold them all. A GPS system as proposed by Philip G. Mattos "Global Positioning by Satellite", Electronics & Wireless World, February 1989 still needs a package volume of 80 mm by 125 mm by 25 mm. However, the capacity of the electronics within such a GPS system are known to be vastly under-utilised. It is therefore possible to utilise this spare capacity to permit a substantial reduction of the volume mass of electronics which are required in the other modules. For example, the IMS T222 transputer (a new type of electronic chip) has the capacity of a 10 MIP parallel processing computer. Thus we can place all of the signal processing functions for all of the other modules onto such a transputer by simply scheduling any convenient sequence of software events to suit the particular needs.

The proposed use of such electronics may seem of itself to be obvious, but the resulting small package creates a

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range of completely new products and markets. For example, a child or young girl on the way to or from school will be able to alert his or her parents to any potential danger en route. An attractive and vulnerable young woman walking home at night can alarm the police (or indeed any convenient person) of potential as well as actual danger.

Thus the proposed portable photographic security system will provide substantially enhanced security to any person travelling while at the same time simple adaptations will make possible the use of such a system in any vehicle or building.

CLAIMS:

1. A portable security system comprising in combination a position location system, an electronic camera and a transmitter for transmitting both the positional information received from the position location system and the image received by the electronic camera to a remote receiver.

2. A system as claimed in claim 1 in which the position location system comprises means for receiving positional information from satellites, ground stations and like reference point transmitters and means for converting the received information into display information for locating the position of the location system on a map.

3. A system as claimed in claim 1 or claim 2 including at least one sensor for receiving information about the environment of the security system, and means for processing that information into a form transmittable by the transmitter.

4. A system as claimed in claim 3, wherein the sensor is a microphone.

5. A system as claimed in claim 4 when adapted to be sound activated.

6. A system as claimed in any one of the preceding claims when adapted to be activated by a manually operable switch.

7. A system as claimed in any one of the preceding claims including an internal memory for storing at least some of the transmitted information.

8. A system as claimed in claim 7, wherein the internal memory is pre-programmed with information about the user of the system which is also transmitted by the transmitter.

9. A system as claimed in any one of the preceding claims, wherein the operations thereof are combined and controlled by software.

10. In combination, a portable security system as claimed in any one of the preceding claims and a remote receiving system adapted to receive the information transmitted by the transmitter of the portable security system.

11. The combination of claim 9 including means for transforming the received information from the camera into a printed image.

12. The combination of claim 9 or claim 10 including means for displaying the received information from the position location system on a map.

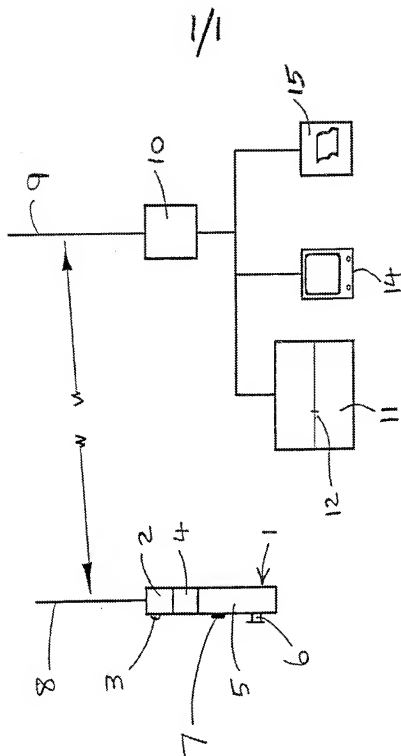


FIG 1

INTERNATIONAL SEARCH REPORT

International Application No. PCT/GB 90/00062

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) * According to International Patent Classification (IPC) or to both National Classification and IPC IPC5: G 08 B 25/00, 13/00, G 01 S 5/14														
II. FIELDS SEARCHED Minimum Documentation Searched * <table border="1"> <tr> <th>Classification System</th> <th>Classification Symbols</th> </tr> <tr> <td>IPC5</td> <td>G 08 B, G 01 S</td> </tr> </table> Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched *			Classification System	Classification Symbols	IPC5	G 08 B, G 01 S								
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IPC5	G 08 B, G 01 S													
III. DOCUMENTS CONSIDERED TO BE RELEVANT * <table border="1"> <tr> <th>Category *</th> <th>Citation of Document, ** with indication, where appropriate, of the relevant passages **</th> <th>Relevant to Claim No. **</th> </tr> <tr> <td>Y</td> <td>US, A, 4651143 (T. YAMANAKA) 17 March 1987, see column 1, line 39 - line 64; column 2, line 4 - line 64 --</td> <td>1,10</td> </tr> <tr> <td>Y</td> <td>EP, A2, 242099 (ADVANCED STRATEGICS, INC.) 21 October 1987, see the whole document --</td> <td>1,10</td> </tr> <tr> <td>Y,P</td> <td>Electronics & Wireless World, Vol. 95, No. 1636 February 1989, P.G. Mattos: "Global Positioning by Satellite", see page 137 - page 142 --</td> <td>1,10</td> </tr> </table>			Category *	Citation of Document, ** with indication, where appropriate, of the relevant passages **	Relevant to Claim No. **	Y	US, A, 4651143 (T. YAMANAKA) 17 March 1987, see column 1, line 39 - line 64; column 2, line 4 - line 64 --	1,10	Y	EP, A2, 242099 (ADVANCED STRATEGICS, INC.) 21 October 1987, see the whole document --	1,10	Y,P	Electronics & Wireless World, Vol. 95, No. 1636 February 1989, P.G. Mattos: "Global Positioning by Satellite", see page 137 - page 142 --	1,10
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Y,P	Electronics & Wireless World, Vol. 95, No. 1636 February 1989, P.G. Mattos: "Global Positioning by Satellite", see page 137 - page 142 --	1,10												
* Special categories of cited documents: ** "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "A" document member of the same patent family														
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III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
Y	WO, A2, 88/00747 (DENNING MOBILE ROBOTICS, INC.) 28 January 1988, see the whole document	1,10
Y	EP, A2, 28933 (ASCOTTS LTD.) 20 May 1981, see the whole document	1,10

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 4651143	17/03/87	JP-A- 61077484	21/04/86
EP-A2- 242099	21/10/87	NONE	
WO-A2- 88/00747	28/01/88	NONE	
EP-A2- 28933	20/05/81	NONE	